

REMARKS

Claims 1-22 are currently pending. By this Amendment, claims 1, 10, 21 and 22 have been amended.

In numbered paragraph 4, page 2 of the Office Action, independent claims 1 and 10, along with various dependent claims, are rejected as allegedly being anticipated by U.S. Patent No. 5,657,402 (Bender et al.). In numbered paragraph 6, page 4 of the Office Action, dependent claims 6, 7, 15 and 16 are rejected as allegedly being unpatentable over the Bender et al. patent in view of U.S. Patent 6,269,175 (Hanna et al.). In numbered paragraph 7, page 4 of the Office Action, dependent claims 4 and 13 are rejected as being unpatentable over the Bender et al. patent in view of U.S. Patent 6,205,259 (Komiya et al.). In numbered paragraph 8, page 5 of the Office Action, dependent claims 8, 9, 17 and 18 are rejected as being unpatentable over the Bender et al. patent in view of U.S. Patent 6,047,028 (Van Ackere et al.). In numbered paragraph 9, page 5 of the Office Action, dependent claims 5 and 14 are rejected as being unpatentable over the Bender et al. patent in view of U.S. Patent 6,556,704 (Chen). In numbered paragraph 10, page 5 of the Office Action, independent claims 21 and 22 are rejected as allegedly being unpatentable over U.S. Patent 6,208,765 (Bergen) in view of U.S. Patent 6,438,275 (Martins et al.). These rejections are respectfully traversed.

Applicants have disclosed methods and systems for processing imagery and enhancing visual images. Imagery can be captured using an image capture device, including, for example, thermal, radar imaging and/or infrared sensors (e.g., paragraph 0022). In one example, an improved night image resulting from an exemplary extended range image processing from a stationary position is

demonstrated using an exemplary mid-wavelength infrared (MWIR) staring imagery (paragraph 0053). However, the image capture device can encompass a wide variety of other devices, including, a CCD camera, FLIR, a vidicon camera, a Low Light Level camera, a laser illuminated camera, or any other EO sensor capable of collecting image data (e.g., paragraph 0052).

The disclosed methods and systems can process successive image frames (e.g., paragraph 0006) obtained from an image capture device 118 (e.g., paragraph 0012) disposed in a remote or stationary location (e.g., paragraphs 0005 and 0053) to generate input data (e.g., paragraph 0006). By correlating, spatially oversampling and registering frames (e.g., paragraphs 0031, 0045, and 0048) from a given image capture device 118, resolution is enhanced and temporal and spatial noise reductions are achieved to yield enhanced image output for the given image capture device (e.g., paragraph 0053).

The foregoing features are broadly encompassed by Claims 1, 10, 21 and 22. For example, claim 1 recites a method for processing imagery using an Electro-Optical (EO) system. The method comprises steps of selecting a first frame of data as a template frame, capturing a second frame of data using the EO system, correlating at least a portion of the second frame with the template frame to generate a shift vector, and registering the second frame with the template frame by interpolating the second frame using the shift vector and re-sampling by spatially oversampling at least a portion of the second frame by a factor greater than one to produce a registered frame. Claim 1 further recites first and second frames being obtained from a stationary infrared imagery. Claims 21 and 22 recite spatially oversampling at least a portion of aligned second frame of image data by a factor

greater than one, integrating the spatially oversampled portion of the aligned second frame of image data with image data of a template frame, and processing frames of data into a continuous video stream, wherein the first and second frames of image data are based on an input data from a stationary sensor.

The Bender et al. patent discloses a method for generating a still image from a plurality of images, each resulting from a distinct focal length (see, e.g., Abstract). The Bender et al. patent discloses scaling the focal lengths and combining the images such that part of the new image will have higher resolution than either of the original images (col. 2, lines 1-40). Scaling of focal lengths as taught by Bender et al. patent necessarily changes the field of view, which close-up view is relied upon to enhance the resolution of a portion of a larger image (col. 3, lines 12-17; Figs. 3-5). The Bender et al. patent relies on a composite of two images of varying fields of view to achieve improved resolution. In contrast, the claimed method and system encompass first and second frames being obtained from a stationary infrared imagery, as recited in claims 1 and 10.

The Hanna et al. patent does not cure the deficiencies of the Bender et al. patent. The Hanna et al. patent discloses reducing temporal scintillation and flicker by using multiple temporal samples (col. 12, lines 4-16), but the disclosure does not relate to frames of data captured from a stationary infrared imagery. The Hanna et al. patent does not teach or suggest at least re-sampling by spatially oversampling at least a portion of a second frame by a factor greater than one to produce a registered frame, wherein first and second frames are obtained from a stationary infrared imagery, as recited in claims 1 and 10.

The Komiya et al. patent, the Van Ackere et al. patent, and the Chen patent do not cure the deficiencies of the Bender et al. patent. The Komiya et al. patent was applied for the disclosure of an image synthesizing circuit 121, the Van Ackere et al. patent was applied for its disclosure of temporal filtering (abstract), and the Chen patent was applied for its disclosure of depth values in a depth map (col. 4, lines 1-13). However, the applied references do not teach or suggest at least the claimed method and system for processing imagery using an Electro-Optical (EO) system, wherein the first and second frames are obtained from a stationary infrared imagery, as recited in claims 1 and 10.

The Bergen patent discloses a method and apparatus for improving the quality of digital images wherein each of the images is produced with a different perspective. The Bergen patent takes images sampled at different locations to combine images (col. 3, lines 2-9). However, the Bergen patent does not teach or suggest a method and system for enhancing visual images, including selecting a first frame of image data as a template frame; capturing a second frame of image data, wherein the first and second frames of image data are based on an input data from a stationary sensor, as recited in claims 21 and 22.

The Martins et al. patent was applied for the disclosure of improving the quality of a video stream by varying the resolution of each frame of a video stream (col. 1, lines 29-30), however, the Martins et al. patent does not teach or suggest a method and system for enhancing visual images, including selecting a first frame of image data as a template frame; capturing a second frame of image data, wherein the first and second frames of image data are based on an input data from a stationary sensor, as recited in claims 21 and 22.

As such, Applicants' independent claims 1, 10, 21 and 22 are allowable. The remaining claims depend from independent claims 1 and 10, and recite additional advantageous features which further distinguish over the documents relied upon by the Examiner. As such, the present application is considered in condition for allowance.

All objections and rejections raised in the Office Action having been addressed, it is respectfully submitted that the application is in condition for allowance and a Notice of Allowance is respectfully solicited.

Respectfully submitted,

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Date: November 29, 2005

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